

AMENDMENTS TO THE CLAIMS

This Listing of Claims will replace all prior versions and listings of the Claims in the subject Patent Application:

Listing of Claims:

Claim 1 (Currently amended): A method of performing adaptive intra refresh, the method comprising:

receiving a packet loss probability value;

receiving a motion vector for a first macroblock in a first frame;

mapping the motion vector onto portions of a plurality of other macroblocks in a previous frame;

calculating at least a first transition factor value based at least in part on the mapping;

calculating an estimated inter distortion value for the first macroblock based on at least the packet loss probability value and the first transition factor value;

calculating an estimated intra distortion value for the first macroblock based on at least a squared initial error energy value multiplied by the packet loss probability value;

receiving a first bit quantity value corresponding to a bit quantity used to intracode the first macroblock;

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receiving a second bit quantity value corresponding to a bit quantity used to intercode the first macroblock; and

determining a first difference value based on a difference between the estimated intra distortion value and the estimated inter distortion value, and a second difference value based on a difference between the first bit quantity value and the second bit quantity value;

based at least in part on ~~the estimated inter distortion value, the estimated intra distortion value~~ $[[,]]$ the first ~~bit quantity~~ difference value $[[,]]$ and the second ~~bit quantity~~ difference value, transmitting the first macroblock as one of an intra macroblock and an inter macroblock.

Claim 2 (Original): The method as defined in claim 1, further comprising transmitting the first macroblock as one of an intra macroblock and an inter macroblock based in part on a quantization distortion value.

Claim 3 (Cancelled).

Claim 4 (Currently amended): The method as defined in claim 2 1, wherein the first macroblock is transmitted as an intra macroblock at least partly in response to the second

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difference value being positive, and the first difference value divided by the second difference value being more negative than a first threshold.

Claim 5 (Currently amended): The method as defined in claim 2 1, wherein the first macroblock is transmitted as an intra macroblock at least partly in response to the second difference value being zero, and the first difference value being negative.

Claim 6 (Currently amended): The method as defined in claim 2 1, wherein the first macroblock is transmitted as an intra macroblock at least partly in response to the second difference value being negative, and the first difference value divided by the second difference value being greater than a first threshold.

Claim 7 (Original): The method as defined in claim 6, wherein the first threshold is a weighting factor.

Claim 8 (Currently amended): The method as defined in claim 2 1, wherein the first macroblock is transmitted as an inter macroblock at least partly in response to the second difference value being zero, and the first difference value being positive.

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Claim 9 (Currently amended): The method as defined in claim 2 1, wherein the first macroblock is transmitted as an intra macroblock at least partly in response to the second difference value being negative, and the first difference value divided by the second difference value being less than a first threshold.

Claim 10 (Currently amended): The method as defined in claim 2 1, wherein the first macroblock is transmitted as an intra macroblock at least partly in response to the second difference value being positive, and the first difference value divided by the second difference value being less than a first threshold.

Claim 11 (Original): The method as defined in claim 1, wherein the estimated intra distortion value is further based on an initial error energy.

Claim 12 (Canceled).

Claim 13 (Original): The method as defined in claim 1, wherein the estimated inter distortion value is recursively calculated to include distortion propagated from a plurality of previous frames.

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Claim 14 (Original): The method as defined in claim 1, wherein the first transition factor corresponds to a first half-pixel horizontal and vertical propagation strength.

Claim 15 (Original): The method as defined in claim 1, wherein the first transition factor corresponds to a first half-pixel horizontal strength.

Claim 16 (Original): The method as defined in claim 1, wherein the first transition factor corresponds to a first half-pixel vertical propagation strength.

Claim 17 (Original): The method as defined in claim 1, further comprising limiting how many macroblocks can be intracoded in the first frame to a first amount.

Claim 18 (Currently amended): A method of selectively intracoding macroblocks, the method comprising:

- receiving a packet loss probability value;

- receiving a motion vector for a first macroblock in a first frame;

- based at least in part on the motion vector, determining which portions of macroblocks in a previous frame would be used in predicting the first macroblock;

calculating at least a first propagation strength value based at least in part on determining which portions of macroblocks in the previous frame would be used in predicting the first macroblock;

calculating an estimated inter distortion value for the first macroblock based on at least the packet loss probability value and the first propagation strength value;

calculating an estimated intra distortion value for the first macroblock based on at least the packet loss probability value;

calculating a quantization distortion value for the first macroblock;

receiving a first bit quantity value corresponding to a bit quantity used to intracode the first macroblock;

receiving a second bit quantity value corresponding to a bit quantity used to intercode the first macroblock; and

based at least in part on a difference between the estimated inter distortion value [[,]] and the estimated intra distortion value, the quantization distortion value, and a difference between the first bit quantity value [[,]] and the second bit quantity value, providing for transmission the first macroblock as one of an intra macroblock and an inter macroblock.

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Claim 19 (Original): The method as defined in claim 18, wherein the intra distortion value is further based on an initial error energy.

Claim 20 (Original): The method as defined in claim 18, wherein the estimated inter distortion value is recursively calculated to include distortion propagated from a plurality of previous frames.

Claim 21 (Original): The method as defined in claim 18 wherein the intra distortion value is further based on an initial error energy squared multiplied by the packet loss probability value.

Claim 22 (Original): The method as defined in claim 18, wherein the first macroblock is provided as one of an intra macroblock and an inter macroblock further based upon a weighting factor.

Claim 23 (Original): The method as defined in claim 22, wherein the weighting factor is generated at least in part by calculating a plurality of intra distortions values using corresponding different quantization parameters, and selecting a weighting factor value that results in the lowest distortion value meeting a first bitrate criterion.

Claim 24 (Currently amended): A method of selectively intracoding macroblocks in a plurality of macroblocks in a first frame, the method comprising:

receiving a packet loss probability value;

receiving a corresponding motion vector for each macroblock in the plurality of macroblocks;

based at least in part on the corresponding motion vector, determining which portions of macroblocks in a previous frame would be used in predicting said each macroblock;

calculating for each of said macroblocks at least a first corresponding propagation strength value based at least in part on ~~determining which~~ said portions of macroblocks in the previous frame ~~would~~ determined to be used in predicting said each macroblock;

calculating for each of said macroblocks an estimated inter distortion value based upon at least the packet loss probability value and the corresponding at least first propagation strength value;

calculating for each of said macroblocks an estimated intra distortion value based upon at least the packet loss probability value;

calculating for each of said macroblocks a quantization distortion value; and

based at least in part on the quantization distortion values for each macroblock in the plurality of macroblocks and a difference between the estimated inter distortion [[,]] and the estimated intra distortion, ~~and the quantization distortion values for each macroblock in the plurality of macroblocks~~ [[,]] designating a subset of the plurality of macroblocks to be intracoded.

Claim 25 (Original): The method as defined in claim 24, wherein the subset is limited to a predetermined number of macroblocks.

Claim 26 (Original): The method as defined in claim 24, further comprising:

for each of said macroblocks, receiving a first bit quantity value corresponding to a bit quantity used to intracode said each macroblock; and

for each of said macroblocks, receiving a second bit quantity value corresponding to a bit quantity used to intercede said each macroblock, wherein the subset is designated based in part on the first bit quantity values and the second bit quantity values.

Claim 27 (Currently amended): A circuit configured to selectively intracode macroblocks, the circuit comprising:

a first instruction configured to receive a packet loss probability value;

a second instruction configured to receive a motion vector for a first macroblock in a first frame;

a third instruction configured to determine, based at least in part on the motion vector, which portions of macroblocks in a previous frame would be used in predicting the first macroblock;

a fourth instruction configured to calculate at least a first propagation strength value based at least in part on the determination of which portions of macroblocks in the previous frame would be used in predicting the first macroblock;

a fifth instruction configured to calculate an estimated inter distortion value for the first macroblock based on at least the packet loss probability value and the first propagation strength value;

a sixth instruction configured to calculate an estimated intra distortion value for the first macroblock based on at least a squared initial energy value multiplied by the packet loss probability value; and

a seventh instruction for calculating a difference between the estimated intra distortion value and the estimated inter distortion value; and

an eighth ~~a seventh~~ instruction configured to selectively provide for transmission of the first macroblock as one of an intra macroblock and an inter macroblock based at

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least in part on the difference between the estimated inter distortion value and the estimated intra distortion value.

Claim 28 (Original): The circuit as defined in claim 27, wherein the intra distortion value is further based upon an initial error energy.

Claim 29 (Currently amended): The circuit as defined in claim 27, further comprising an ~~eighth~~ ninth instruction configured to calculate a quantization distortion value for the first macroblock, wherein the eighth ~~seventh~~ instruction is further configured to selectively provide for transmission of the first macroblock as one of an intra macroblock and an inter macroblock based at least in part on the quantization distortion value.

Claim 30 (Original): The circuit as defined in claim 27, wherein the fifth instruction is further configured to recursively calculate the estimated inter distortion value to thereby include distortion propagated from a plurality of previous frames.

Claim 31 (Canceled).

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Claim 32 (Currently amended): The circuit as defined in claim 27, wherein the seventh instruction is further configured to selectively provide for transmission of the first macroblock as one of an intra macroblock and an inter macroblock based at least in part on a weighting factor.